

Mathematics and swimming of aquatic organisms

Marius Tucsnak

(Univ. de Lorraine, Nancy, France)

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We consider several mathematical models describing the motions of solids immersed in an incompressible fluid. We begin by emphasising that, depending on the flow regime, the governing equations may exhibit a wide range of properties, leading to a rich mathematical structure. We next discuss well-posedness issues, where the major difficulty to be solved consists in tackling the presence of free boundaries. Finally we study the displacement of the solids (under the action of an exterior force or in a self-propelled manner) from a control theoretical perspective.